

# **Importation of Pepper Fruits, *Capsicum* spp., from Spain into the United States**

## **Qualitative, Pathway-Initiated Pest Risk Assessment**

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### **Agency Contact:**

**Biological Assessment and Taxonomic Support  
Plant Protection and Quarantine  
Animal and Plant Health Inspection Service  
U.S. Department of Agriculture  
4700 River Road, Unit 133  
Riverdale, MD 20737-1236**

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## A. Introduction

This pest risk assessment was prepared by the Animal and Plant Health Inspection Service (APHIS) of the U.S. Department of Agriculture (USDA) to examine plant pest risks associated with the importation into the United States of **fresh pepper fruits (*Capsicum spp.*) grown in Spain**. This is a qualitative pest risk assessment, that is, estimates of risk are expressed in qualitative terms such as high or low rather than numerical terms such as probabilities or frequencies. The details of methodology and rating criteria can be found in *Pathway-Initiated Pest Risk Assessment: Guidelines for Qualitative Assessments, version 4.0* (USDA, 1995); available from the individual named in the proposed regulations, or on our web site at [www.aphis.usda.gov/ppq/bats/bant](http://www.aphis.usda.gov/ppq/bats/bant).

International plant protection organizations, *e.g.*, North American Plant Protection Organization (NAPPO) and International Plant Protection Convention (IPPC) of the United Nations Food and Agriculture Organization (FAO), provide guidance for conducting pest risk analyses. The methods used to initiate, conduct, and report this plant pest risk assessment are consistent with guidelines provided by NAPPO, IPPC and FAO. Our use of biological and phytosanitary terms, *e.g.*, introduction, quarantine pest, conforms with the *NAPPO Compendium of Phytosanitary Terms* (Hopper, 1996) and the *Definitions and Abbreviations* (Introduction Section) in *International Standards for Phytosanitary Measures, Section 1—Import Regulations: Guidelines for Pest Risk Analysis* (FAO 1996).

Pest risk assessment is one component of an overall pest risk analysis. The *Guidelines for Pest Risk Analysis* provided by FAO (1996) describe three stages in pest risk analysis. This document satisfies the requirements of FAO Stages 1 (initiation) and 2 (risk assessment).

## B. Risk Assessment

### 1. Initiating Event: Proposed Action

This pest risk assessment is commodity-based, and therefore "pathway-initiated"; the assessment is in response to a request for USDA authorization to allow importation of a particular commodity presenting a potential plant pest risk. In this case, the importation of **fresh pepper fruits (*Capsicum spp.*) grown in Spain** is a potential pathway for introduction of plant pests. Regulatory authority for the importation of fruits and vegetables from foreign sources into the U.S. is found in 7 CFR §319.56 .

## 2. Assessment of Weediness Potential of pepper, *Capsicum* spp.

The results of the weediness screening for *Capsicum* spp. (Table 1) did not prompt a pest-initiated risk assessment.

**Table 1: Process for Determining Weediness Potential of Commodity**

**Commodity:** *Capsicum* (Solanaceae). Native to western South America

**Phase 1:** *Capsicum* is widely cultivated commercially and residentially in the United States.

**Phase 2:** Is the species listed in:

- |            |  |
|------------|--|
| <u>YES</u> | <i>Geographical Atlas of World Weeds</i> (Holm <i>et al.</i> , 1979)   |
| <u>NO</u>  | <i>World's Worst Weeds</i> (Holm <i>et al.</i> , 1977)   |
| <u>NO</u>  | <i>Report of the Technical Committee to Evaluate Noxious Weeds; Exotic Weeds for Federal Noxious Weed Act</i> (Gunn and Ritchie, 1982)   |
| <u>NO</u>  | <i>Economically Important Foreign Weeds</i> (Reed, 1977)   |
| <u>NO</u>  | Weed Science Society of America list (WSSA, 1989)  |
| <u>NO</u>  | Is there any literature reference indicating weediness ( <i>e.g.</i> , <i>AGRICOLA</i> , <i>CAB</i> , <i>Biological Abstracts</i> , <i>AGRIS</i> ; search on "species name" combined with "weed"). |

**Phase 3: Conclusion:** Holm *et al.* include *Capsicum annuum* L. in the *Geographical Atlas of World Weeds* as a weed of unknown importance in Australia and India. Commercial pepper is currently imported from many countries and imports from Spain are unlikely to present any increased weed potential than the pepper currently produced in the United States.

## 3. Previous Risk Assessments, Current Status

### 3a. Decision history for *Capsicum* spp.

- 1972 - France: Denied entry - Treatment not available for powdery mildew disease.  
1978 - Canary Islands: Denied entry - No approved treatments for *Ceratitis capitata* and *Heliothis armigera*.  
1984 - Spain: Denied entry - No approved treatments for *Ceratitis capitata* and *Heliothis armigera*.

#### 4. Pest List: Pests Associated with *Capsicum*

The pests, listed for *Capsicum* spp. in Table 2, were developed after a review of the information sources listed in USDA (1995). The list summarizes information on the distribution of each pest, pest-commodity association, and regulatory history.

Table 2: Pest List - <i>Capsicum</i> spp.					
ORGANISM	GROUP	SUBGROUP	DISTRIBUTION	COMMENTS <sup>a</sup>	REFERENCES
<b>Bacteria</b>					
<i>Agrobacterium tumefaciens</i> (Smith and Townsend) Conn.			SP,US	e,o	Bradbury, 1986
<i>Erwinia chrysanthemi</i> Burkholder, McFadden & Dimmoch			SP,US	o	Bradbury, 1986
<i>Pseudomonas corrugata</i> Roberts & Scarlett			SP,US	a,o	Bradbury, 1986; Lopez <i>et al.</i> , 1994
<i>Pseudomonas solanacearum</i> (Smith) Smith			SP,US	a,o	Bradbury, 1986; EPPO, 1995
<i>Pseudomonas viridisflava</i> (Burkholder) Dowson			SP,US	o	Bradbury, 1986
<i>Xanthomonas campestris</i> pv. <i>vesicatoria</i> (Dodge) Dye			SP,US	o	EPPO, 1995; FAO, 1993; Bradbury, 1986
<b>Fungi</b>					
<i>Alternaria solani</i> Sorauer	Fungi Imperfecti	Hyphomycetes	SP,US	o,Z <sub>a</sub>	Farr <i>et al.</i> , 1989; MacNab <i>et al.</i> , 1983
<i>Botrytis cinerea</i> Pers.	Fungi Imperfecti	Hyphomycetes	SP,US	o	Farr <i>et al.</i> , 1989; Lopez, 1988
<i>Cercospora capsici</i> Heald & F.A. Wold	Fungi Imperfecti	Hyphomycetes	SP,US	o	Farr <i>et al.</i> , 1989; Ibar, 1987
<i>Colletotrichum acutatum</i> Simmonds	Fungi Imperfecti	Coelomycetes	SP,US	a,c,o	EPPO, 1995
<i>Colletotrichum gloeosporioides</i> (Penz.) Penz. & Sacc in Penz.	Fungi Imperfecti	Coelomycetes	SP,US	o	Farr <i>et al.</i> , 1989; Ibar, 1987
<i>Fusarium oxysporum</i> Schlechtend.: Fr. f. sp. <i>lycopersici</i> (Sacc.) W.C. Snyder & H.N. Hans.	Fungi Imperfecti	Hyphomycetes	SP,US	a,o	Farr <i>et al.</i> , 1989; Ibar, 1987
<i>Leveillula taurica</i> (Lev.) G. Arnaud	Pyrenomycetes	Erysiphales	SP,US	o	CMI, 1984b; Farr <i>et al.</i> , 1989
<i>Macrophomina phaseolina</i> (Tassi) Goidanich	Fungi Imperfecti	Coelomycetes	SP,US	a,o	FAO, 1993; Farr <i>et al.</i> , 1989; Snowdon, 1991
<i>Peronospora tabacina</i> D. B. Adam	Oomycetes	Peronosporales	SP,US	o	Farr <i>et al.</i> , 1989; IMI, 1993
<i>Phaeoramularia capsicicola</i> (Vassiljevsky) Deighton	Fungi Imperfecti	Hyphomycetes	SP,US	a,o	Farr <i>et al.</i> 1989; Ibar, 1987
<i>Phytophthora capsici</i> Leonian	Oomycetes	Peronosporales	SP,US	o,Z <sub>a</sub>	Gill <i>et al.</i> , 1995; Farr <i>et al.</i> , 1989
<i>Pythium debaryanum</i> Auct. non R. Hesse	Oomycetes	Peronosporales	SP,US	a,o	CMI, 1984a; Farr <i>et al.</i> , 1989
<i>Rhizoctonia solani</i> Kuhn	Fungi Imperfecti	Agonomycetes	SP,US	o	Farr <i>et al.</i> , 1989; Melero Vara and Jimenez Diaz, 1990

ORGANISM	GROUP	SUBGROUP	DISTRIBUTION <sup>a</sup>	COMMENTS <sup>b</sup>	REFERENCES
<i>Sclerotinia sclerotiorum</i> (Lib.) de Bary	Discomycetes	Helotiales	SP,US	o	Farr <i>et al.</i> , 1989; Ibar 1987
<i>Sclerotium rolfsii</i> Sacc.	Fungi Imperfecti	Agonomycetes	SP,US	a,o	IMI, 1992; Farr <i>et al.</i> , 1989
<i>Stemphylium botryosum</i> Wallr.	Fungi Imperfecti	Hyphomycetes	SP,US	o	Farr <i>et al.</i> , 1989; U.S. National Fungus Collection
<i>Stemphylium solani</i> G. F. Weber	Fungi Imperfecti	Hyphomycetes	SP,US	o	Black <i>et al.</i> , 1991; Farr <i>et al.</i> , 1989; Ferrari <i>et al.</i> , 1990
<i>Verticillium dahliae</i> Kleb.	Fungi Imperfecti	Hyphomycetes	SP,US	a,o	Farr <i>et al.</i> , 1989; Ortega <i>et al.</i> , 1990

#### Acarina

<i>Aculops lycopersici</i> (Massee)	Acari	Eriophyidae	SP,US	o	CDFA, 1997; FAO, 1993
<i>Polyphagotarsonemus latus</i> (Banks)	Acari	Tarsonemidae	SP,US	o	Jeppson <i>et al.</i> , 1975; Mar Abad Martin, 1983
<i>Tetranychus cinnabarinus</i> (Boisduval)	Acari	Tetranychidae	SP,US	o	CIE, 1978; Hill, 1987
<i>Tetranychus urticae</i> Koch	Acari	Tetranychidae	SP,US	o	Hill, 1987; Zatyko and Martinovich, 1986

#### Insecta

<i>Acherontia atropos</i> Linnaeus	Lepidoptera	Sphingidae	SP	e	Zhang, 1994
<i>Acyrthosiphon pisum</i> (Harris)	Homoptera	Aphididae	SP,US	a,o,y	Arnett, 1985; Fereres <i>et al.</i> , 1993
<i>Agriotes lineatus</i> (Linnaeus)	Lepidoptera	Elateridae	SP	a	Ibar, 1987
<i>Agriotes obscurus</i> (Linnaeus)	Lepidoptera	Elateridae	SP	a	Ibar, 1987
<i>Agrotis ipsilon</i> Hufnagel	Lepidoptera	Noctuidae	SP,US	o	Hill, 1987; Zhang, 1994
<i>Agrotis segetum</i> Denis & Schiffermuller	Lepidoptera	Noctuidae	SP	a	Ibar, 1987
<i>Aleurodicus dispersus</i> Russell	Homoptera	Aleyrodidae	SP,US	a,o	FAO, 1993; Mound and Halsey, 1978
<i>Anthonomus</i> sp.	Coleoptera	Curculionidae	SP	x	USDA, 1997
<i>Aphis fabae</i> Scopoli	Homoptera	Aphididae	SP,US	a,o,y	CIE, 1963; Fereres <i>et al.</i> , 1993
<i>Aphis gossypii</i> Glover	Homoptera	Aphididae	SP,US	a,o,y	CIE, 1968; Fereres <i>et al.</i> , 1993
<i>Bemisia tabaci</i> (Gennadius)	Homoptera	Aleyrodidae	SP,US	a,o,y <sub>4</sub>	CIE, 1986; Gonzalez <i>et al.</i> , 1996b
<i>Ceratitis capitata</i> (Widemann)	Diptera	Tephritidae	SP,US <sup>b</sup>	z <sub>i</sub>	Liquidio <i>et al.</i> , 1991; USDA, 1982
<i>Chrysodeixis chalcites</i> Esper	Lepidoptera	Noctuidae	SP	k	Casadevall <i>et al.</i> , 1979; Ramakers, 1979
<i>Circulifer tenellus</i> (Baker)	Coleoptera	Cicadellidae	SP,US	a,o	CIE, 1961; EPPO, 1995
<i>Delia platura</i> (Meigen)	Diptera	Anthomyiidae	SP,US	o,z	CIE, 1985; FAO, 1993; Prado, 1991
<i>Diuraphis noxia</i> (Mordvilko)	Homoptera	Aphididae	SP,US	a,o,y	III, 1991b; Perez <i>et al.</i> , 1995
<i>Empoasca flavescens</i> (Fabricius)	Coleoptera	Cicadelidae	SP	a	CDFA, 1997; CIE, 1974
<i>Euzophera osseatella</i> Treitschke	Lepidoptera	Pyralidae	SP	a	Avidov and Harpaz, 1969; FAO, 1993

ORGANISM	GROUP	SUBGROUP	DISTRIBUTION <sup>a</sup>	COMMENTS <sup>b</sup>	REFERENCES
<i>Frankliniella occidentalis</i> (Pergande)	Thysanoptera	Thripidae	SP,US	a,o,y	III, 1993; Gonzalez Zamora and Moreno Vazquez, 1996a; Lacasa et al., 1994
<i>Gryllotalpa africana</i> Palisot de Beauvois	Orthoptera	Gryllotalpidae	SP	a	Anon, 1986; CIE, 1971; INKTO
<i>Helicoverpa armigera</i> (Hubner)	Lepidoptera	Noctuidae	SP	x,z	Biurrun and Esparza, 1991; USDA, 1997
<i>Heliothis</i> sp.	Lepidoptera	Noctuidae	SP	x	USDA, 1997
<i>Icerya purchasi</i> Maskell	Homoptera	Margarodidae	SP,US	a,o	CDFA, 1997; EPPO 1995
<i>Jacobiasca</i> (=Empoasca) <i>lybica</i> (Bergevin)	Coleoptera	Cicadellidae	SP	a	Avidov and Harpaz, 1969; FAO, 1993
<i>Lacanobia oleracea</i> (L.)	Lepidoptera	Noctuidae	SP	z	Cleve and Gerstberger, 1981; Oakley, 1949
<i>Leptinotarsa decemlineata</i> (Say)	Coleoptera	Chrysomelidae	SP,US	o	Ibar, 1987
<i>Liriomyza bryoniae</i> Kaltenbach	Diptera	Agromyzidae	SP	a	EPPO, 1995; Hill, 1987
<i>Liriomyza huidobrensis</i> (Blanchard)	Diptera	Agromyzidae	SP,US(CA,HI,TX,UT,WA)	a,h	EPPO, 1995; Gary et al., 1986; Heinz and Chaney, 1995; Malais et al., 1992; Spencer and Steyskal, 1986
<i>Liriomyza trifolii</i> (Burgess)	Diptera	Agromyzidae	SP,US	a,o	CIE, 1984b; FAO, 1993, Spencer, 1973
<i>Macosiphum euphorbiae</i> (Thomas)	Homoptera	Aphididae	SP,US	e,o,y	Blackman and Eastop, 1984; Brunt et al., 1996; CIE, 1954
<i>Mamestra brassicae</i> Linnaeus	Lepidoptera	Noctuidae	SP	a	Anon., 1986; FAO, 1993
<i>Melolontha melolontha</i> (L.)	Coleoptera	Scarabaeidae	SP	a	Ibar, 1987
<i>Myzus persicae</i> (Sulzer)	Homoptera	Aphididae	SP,US	a,o,y	CIE, 1979; Fereres et al., 1993
<i>Neoleucinodes</i> sp. (?)	Lepidoptera	Pyralidae	SP	x	USDA, 1997
<i>Nezara viridula</i> (L.)	Coleoptera	Pentatomidae	SP,US	e,o	CIE, 1970
Noctuidae, species of.	Lepidoptera		SP	x	USDA, 1997
<i>Opogona sacchari</i> Bojer	Lepidoptera	Tineidae	SP,US(FL,HI)	a,g	Davis and Pena, 1990; EPPO, 1995
<i>Ostrinia nubilalis</i> Hubner	Lepidoptera	Pyralidae	SP,US	o	III, 1991a; Zhang, 1994
<i>Peridroma saucia</i> Hubner	Lepidoptera	Noctuidae	SP,US	a,o	CDFA, 1997; Zhang, 1994
<i>Phthorimaea operculella</i> Zeller	Lepidoptera	Gelechiidae	SP,US	o	EPPO, 1995; FAO, 1993
<i>Pseudococcus longispinus</i> (Targioni Tozzetti)	Homoptera	Pseudococcidae	SP,US	o	CIE, 1984a; Hill, 1987
<i>Saissetia coffeae</i> (Wlk.)	Homoptera	Coccidae	SP,US	o	CIE, 1973; Hill, 1987
<i>Spodoptera exigua</i> (Hubner)	Lepidoptera	Noctuidae	SP,US	o	Belda et al., 1994; CIE, 1972
<i>Spodoptera littoralis</i> Boisduval	Lepidoptera	Noctuidae	SP	a	Carter, 1984; USDA, 1982; Zhang, 1994
<i>Thrips tabaci</i> Lind	Thysanoptera	Thripidae	SP,US	o,y	Brunt et al., 1996; CIE, 1969; Hill, 1987
<i>Trialeurodes vaporariorum</i> (West.)	Homoptera	Aleyrodidae	SP,US	a,o	Arnett, 1985; Gonzalez et al., 1996b

ORGANISM	GROUP	SUBGROUP	DISTRIBUTION	COMMENTS <sup>1</sup>	REFERENCES
<b>Phytoplasma</b>					
Stolbur, Aster Yellows			SP,US	Z <sub>1</sub>	Avinent and Llacer, 1995; Jones <i>et al.</i> , 1991
<b>Virus</b>					
Beet curly top virus			SP,US	O,Z <sub>1</sub>	Brunt <i>et al.</i> , 1996; EPPO, 1995; FAO, 1993
Cucumber mosaic virus			SP,US	O,Z <sub>1</sub>	Brunt <i>et al.</i> , 1996; CDFA, 1997; Espin <i>et al.</i> , 1994
Pepper mild mottle virus			SP,US	O,Z <sub>1</sub>	Brunt <i>et al.</i> , 1996; Marte and Wetter, 1986; Gill Ortega and Artega, 1992
Potato virus Y			SP,US	O,Z <sub>1</sub>	Fereres <i>et al.</i> , 1993
Tobacco mosaic virus			SP,US	O,Z <sub>1</sub>	Brunt <i>et al.</i> , 1996
Tomato mosaic virus			SP,US	O,Z <sub>1</sub>	Diaz-Ruis <i>et al.</i> , 1988; Jones <i>et al.</i> , 1991
Tomato yellow leaf curl virus			SP	D,Z <sub>1</sub>	EPPO, 1995
Tomato spotted wilt virus			SP,US	O,Z <sub>1</sub>	Jorda <i>et al.</i> , 1995
<b>Mollusca</b>					
<i>Helix aspersa</i> Muller	'	Helicidae	SP,US	H	Crowell, 1984; FAO, 1993; Phillips and Sakovich, 1987; Prado, 1991

<sup>1</sup> Distribution legend: SP = Spain; US = United States; CA = California; FL = Florida; HI = Hawaii; TX = Texas; UT = Utah; WA = Washington

- <sup>2</sup> Comments:
- a = Pest mainly associated with a plant part other than the commodity.
  - c = Listed in USDA non-reportable dictionary as non-actionable.
  - d = Commodity is unlikely to serve as inoculum source because vector is unknown or does not feed on commodity and/or seed transmission has not been reported.
  - e = Although pest attacks commodity, it would not be expected to remain with the commodity during processing.
  - g = Quarantine pest: pest has limited distribution in the U.S. and is under official control as follows: pest listed by name in USDA's pest dictionary, official quarantine action may be taken on this pest when intercepted on this commodity.
  - h = Quarantine pest: pest has limited distribution in the U.S. and is under official control as follows: (1) pest listed by name in USDA's pest dictionary, official quarantine action may be taken on this pest when intercepted on this commodity and, (2) pest is a program pest.
  - k = Not specifically listed for host, but reported from other hosts in same plant genus/family.
  - o = Organism does not meet the geographic or regulatory definition of a quarantine pest.
  - x = Multiple interception records exist.
  - y = Pest is a vector of plant pathogens.
  - z<sub>1</sub> = External pest: is known to attack or infest *Capsicum* spp. fruits and it would be reasonable to expect the pest may remain with the commodity during processing and shipping.
  - z<sub>1</sub> = Internal pest: is known to attack or infest *Capsicum* spp. and it would be reasonable to expect the pest may remain with the commodity during processing and shipping.

<sup>3</sup>*Ceratitis capitata* has been detected in the United States on several occasions. Whenever *C. capitata* is detected, a quarantine is established and an eradication program is implemented. *C. capitata* is considered to be a quarantine pest.

*Bemisia tabaci* serves as a vector for Tomato yellow leaf curl virus, the virus is persistent within the insect.

## 5. List of Quarantine Pests

The list of quarantine pests for commercial shipments of peppers from Spain is provided in Table 3. Should any of these pests be intercepted on commercial (or any other) shipments of *Capsicum* spp., quarantine action may be taken.

**Table 3: Quarantine Pests:**

<b>Arthropods</b>	<i>Acherotina atropos</i> <i>Agriotes lineatus</i> <i>Agriotes obscurus</i> <i>Agrotis segetum</i> <i>Ceratitis capitata</i> <i>Chrysodeixis chalcites</i> <i>Empoasca flavenescens</i> <i>Euzophera osseatella</i> <i>Gryllotalpa africana</i> <i>Helicoverpa armigera</i> <i>Jacobiasca lybica</i> <i>Liriomyza bryoniae</i> <i>Liriomyza huidobrensis</i> <i>Mamestra brassicae</i> <i>Melolontha melolontha</i> <i>Opogona sacchari</i> <i>Spodoptera littoralis</i>
<b>Virus</b>	Tomato yellow leaf curl virus

## 6. Quarantine Pests Likely to Follow Pathway (i.e., Quarantine Pests Selected for Further Analysis)

Only those quarantine pests that can reasonably be expected to follow the pathway, *i. e.*, be included in commercial shipments of *Capsicum* spp., were analyzed in detail (USDA, 1995). Only quarantine pests listed in Table 4 were selected for further analysis and subjected to steps 7-9 below.

**Table 4: Quarantine Pest Selected for Further Analysis:**

<b>Arthropods</b>	<i>Ceratitis capitata</i> <i>Helicoverpa armigera</i>
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Other plant pests in this Assessment, not chosen for further scrutiny, may be potentially detrimental to the agricultural production systems of the United States; however, there were a variety of reasons for not subjecting them to further analysis. For example, they are associated mainly with plant parts other than the commodity; they may be associated with the commodity (however, it was not considered reasonable to expect these pests to remain with the commodity during processing); they have been intercepted as biological contaminants of these commodities during inspections by Plant Protection and Quarantine Officers; but, would not be expected to be present with every shipment. In addition, the biological hazard of organisms identified only to the generic level are not assessed due to the lack

of adequate biological/taxonomic information. This lack of biological information on any given insect or pathogen should not be equated with low risk. By necessity, pest risk assessments focus on those organisms for which biological information is available. By developing detailed assessments for known pests that inhabit a variety of niches on the parent species, *i.e.* on the surface of or within the bark/wood, on the foliage, etc., effective mitigation measures can be developed to eliminate the known organism and any similar unknown ones that inhabit the same niches.

## 7. Economic Importance: Consequences of Introduction

The consequences of introduction were considered for each quarantine pest selected for further analysis. For qualitative, pathway-initiated pest risk assessments, these risks are estimated by rating each pest with respect to five risk elements. Table 5 shows the risk ratings for these risk elements.

**Table 5: Risk Rating: Consequences of Introduction**

Pest	Climate/ Host	Host Range	Dispersal	Economic	Environ- mental	Risk Rating
<i>Ceratitis capitata</i>	high	high	high	high	high	high
<i>Helicoverpa armigera</i>	high	high	high	medium	medium	high

## 8. Likelihood of Introduction

Each pest is rated with respect to introduction potential, *i.e.*, entry and establishment. Two separate components are considered. First, the amount of commodity likely to be imported is estimated. More imports lead to greater risk; therefore the risk rating for the quantity of commodity is the same for all quarantine pests considered. Second, five biological features, *i.e.* (risk elements) concerning the pest and its interactions with the commodity are considered. The resulting risk ratings are specific to each pest. The cumulative risk rating for introduction was considered to be an indicator of the likelihood that a particular pest would be introduced. Table 6 shows our ratings for these risk elements.

**Table 6: Risk Rating: Likelihood of Introduction**

Pest	Quantity of commodity imported annually	Likelihood survive postharvest treatment	Likelihood survive shipment	Likelihood not detected at port of entry	Likelihood moved to suitable habitat	Likelihood find suitable host	Risk rating
<i>Ceratitis capitata</i>	high	high	high	high	high	high	high
<i>Helicoverpa armigera</i>	high	high	high	medium	high	high	high

## **9. Conclusion: Pest Risk Potential and Phytosanitary Measures**

The measure of pest risk potential combines the risk ratings for consequences and likelihood of introduction (USDA, 1995). The estimated pest risk potential for each quarantine pest selected for further analysis for the importation of *Capsicum* spp. is provided in Table 7.

**Table 7: Pest Risk Potential, Quarantine Pests, Spanish pepper**

Pest	Pest risk potential
<i>Ceratitis capitata</i>	high
<i>Helicoverpa armigera</i>	high

Plant Pests with a high Pest Risk Potential may require specific phytosanitary measures. The choice of appropriate sanitary and phytosanitary measures to mitigate risks is undertaken as part of Risk Management and is not addressed, *per se*, in this document.

PPQ has a Pest Alert out to all ports regarding adult *Bemisia tabaci* interceptions on tomato yellow leaf curl virus host material from countries that have the disease. Fresh pepper leaves contaminating shipments could pose a serious risk.

PPQ has many plant pest interceptions from *Capsicum* spp. from other areas; however, virtually all external pests listed could be detected by inspection. Some of these same pests occur in Spain in addition to other quarantine pests and have been intercepted as hitchhikers with other commodities. Should any of these pests be intercepted on commercial (or any other) shipments of *Capsicum* spp., quarantine action may be taken.

## **C. References**

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John Lightfield  
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Reviewed by:

G. Cave, Entomologist\*  
R. Stewart, Entomologist\*  
E. Podleckis, Plant Virologist\*  
S. Redlin, Plant Pathologist\*  
L. Redmond, Plant Pathologist\*